

contains the recitation of the substance of Claim 7 in different language and is also based on page 31, lines 2-5 and Figure 5 of the specification. Basis for new Claims 13-15 can be found on page 10, lines 1-6 from the bottom, and page 11, line 1 of the specification. Basis for new Claims 16 and 17 can be found on page 19, lines 1-3 from the bottom of the specification. No new matter has been added into the amended claims or new claims.

REQUEST FOR RECONSIDERATION

Claims 1, 3-8 and 11-17 are active in the case.

The rejection of Claims 1-8 under 35 U.S.C. §103(a) as unpatentable over EP 0740952 alone, or in view of JP 3-169330 is traversed.

Claim 1 now contains limitations on both the overall porosity of the composite hollow fiber membrane being not less than 75% by volume and that the isothermal crystallization time τ_s of the resin used for the outermost layer and the innermost layer and the isothermal crystallization time τ_p of the resin used for the dense layer satisfy the following relationship: $1 < \tau_p / \tau_s < 100$. The advantages of having the overall porosity of the composite hollow fiber membrane of not less than 75% by volume are discussed on page 8, lines 6-14 and page 20, lines 4-8 of the specification and indicate that the filtration life of the composite hollow fiber membrane may be extended by meeting the above porosity limitation. Further, the relationship between the isothermal crystallization time of the resin used for the outermost layer and innermost layer and the isothermal crystallization time of the resin used for the dense layer, when satisfied as in amended Claim 1, produces a composite hollow fiber membrane which shows improved properties as described on page 8, lines 2-8 and pages 25, last line through page 26, line 23 of the specification, for example, improved water permeability and separation accuracy. Further, the specification teaches that if the top range

or inherently
elaborated
obvious
Optimization
Declaration

of < 100 is exceeded, orientation in the direction of the thickness of the membrane is disturbed, resulting in a non-uniform distribution of micropore sizes after stretching and an unsatisfactory composite hollow fiber membrane.

Neither EP 0740952 or JP 3-169330 either individually or in combination, meet the above-discussed limitations of Claim 1. There is no description in EP 0740952 that the composite hollow fiber membrane produced in the reference has an overall porosity of not less than 75% by volume, nor is there any description in the European patent of the relationship of the isothermal crystallization time of the resin used for the outermost layer and the innermost layer and the isothermal crystallization time of the resin used for the dense layer of amended Claim 1. JP 3-169330 does not remedy the deficiencies of the European patent, because the void ratio described in the Abstract of the Japanese patent refers only to layer (B) as having a void ratio of 30-90% and does not refer to the porosity of the composite hollow fiber membrane as being not less than 75% by volume. Further, JP 3-169330 neither teaches nor suggests the relationship between the isothermal crystallization time of the resin used for the outermost layer and the innermost layer and the isothermal crystallization time of the resin used for the dense layer of amended Claim 1.

←

invented by disclosed

Further, the fact that the processes of production of the composite hollow fiber membranes in the European patent and the present application are superficially similar would not teach or suggest to the worker of ordinary skill in the art what resins to combine in order to arrive at the relationship of the isothermal crystallization time of the resin used for the outermost layer and the innermost layer and the isothermal crystallization time of the resin used for the dense layer of amended Claim 1. Therefore, the amended claims distinguish over EP 0740952 alone or in combination with JP 3-169330.

hot air

The rejection of Claim 7 under 35 U.S.C. §112, second paragraph, as being indefinite

is traversed.

Claim 7 has been amended to delete the language referred to by the Examiner. However, Claims 11 and 12 have been added to recite the substance of Claim 7 in different language and it is submitted that page 31, lines 2-5 and Figure 5 of the specification clearly describe the composite hollow fiber membrane in new Claims 11 and 12. The claims meet the requirements of 35 U.S.C. § 112.

It is submitted that Claims 3-8 and 11-17 are allowable and such action is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



J. Derek Mason, Ph.D.
Attorney of Record
Registration No. 35,270

Roland E. Martin
Registration No. 48,082



22850

TEL: 703-413-3000

FAX: 703-413-2220

I:\atty\rem\197173US-am.wpd

MARKED-UP COPY OF AMENDMENT

IN THE CLAIMS

--1. (Amended) A composite hollow fiber membrane [made by stacking] comprising three or more layers of [membranes] membrane [that have] comprising a three-dimensional net structure [having] comprising a plurality of micropores [formed from] comprising stacked lamella and microfibrils connected with the stacked lamella, wherein

one or more [a] dense layer(s), [that is] thinner than [the] an outermost layer and [the] an innermost layer and [has] comprising micropores of a mean pore diameter smaller than that of the micropores of the outermost layer and the innermost layer, is disposed as [an] intermediate layer(s), between the outermost layer and the innermost layer, [while] wherein the composite hollow fiber membrane has overall porosity of not less than 75% by volume, and wherein

the isothermal crystallization time τ_s of the resin used for the outermost layer and the innermost layer and the isothermal crystallization time τ_p of the resin used for the dense layer satisfy the following relationship:

$$1 < \tau_p / \tau_s < 100.$$

2. (Cancelled).

3. (Amended) The [composite hollow fiber] membrane according to Claim 1, wherein the outermost layer and the innermost layer have a mean microfibril length in a range from 0.5 to 10 μm and mean distance between microfibrils in a range from 0.1 to 0.6 μm .

4. (Amended) The [composite hollow fiber] membrane according to Claim 1,

wherein the dense layer has a mean microfibril length in a range from 0.2 to 5 μm and a mean distance between microfibrils in a range from 0.02 to 0.3 μm .

5. (Amended) The [composite hollow fiber] membrane according to Claim 1, wherein each of the outermost layer and the innermost layer has a thickness in a range from 5 to 50 μm .

6. (Amended) The [composite hollow fiber] membrane according to Claim 1, wherein the dense layer has a thickness in a range from 3 to 15 μm .

7. (Amended) The [composite hollow fiber] membrane according to Claim 1, [wherein] further comprising a cover layer of a hydrophilic polymer [is formed and the microfibrils are divided into groups of a plurality of pieces that are bundled together].

8. (Amended) The [composite hollow fiber] membrane according to [any one of claims] Claim 1 [to 7], wherein the initial water permeation amount is 25.0 L/(m² · hr · kPa) or higher.

11-17. (New).--